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| EXAMINER | | | | |
| HAHM, SARAH UH YOUNG | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/408,621

Applicant(s)

RENN ET AL.

Examiner

Sarah Hahm

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-42 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 1999 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/C2000)
Paper No(s)/Mail Date 0300
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Drawings

1. This application has been filed with twelve (12) sheets of drawings which have been objected to by the Office Draftsperson (see attached form PTO-948) but which are acceptable for examination purposes only. Corrected drawings are required in response to this Office Action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Specification

2. The abstract of the disclosure is objected to because it exceeds the current 150-word limit. Correction is required. See MPEP § 608.01(b).
3. The disclosure is objected to because of the following informalities: On page 9, in lines 25-28, the Examiner believes that the figures referenced are intended to be FIGS. 7(a)-(d), etc.

Appropriate correction is required.

Claim Objections

4. Claim 16 is objected to because of the following informalities: Examiner suggests "The method", first occurrence, to be changed to "A method".

Appropriate correction is required.

5. Claims 20, 32 is objected to because of the following informalities: In claim 20, "the through channel" in line 5, and "the optical conductor" in line 6 should be changed to "a through channel" and "an optical conductor", respectively, to correct for the lack of proper antecedent basis for those limitations. In claim 32, Examiner believes that "20" should be -30-, and will be examined accordingly.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 13, 14, 26 and 27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Regarding claims 13 and 14, Claim 13 provides for the use of the steps of claim 8 to deposit a plurality of particles onto the substrate, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced. Claim 13 is also indefinite for incorporating dependence of independent claim 11, and claim 8, which is dependent upon independent claim 1; the dependency of the claim is unclear. For purposes of examination, claim 13 will be interpreted as, "The method of Claim 11, further comprising depositing a plurality of particles onto the substrate". Claim 14 inherits the same indefiniteness.

9. Claims 13 and 14 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

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10. Regarding claim 26, as depending from claim 20, “the solid portion” is not previously recited. It is unclear whether or not claim 26 is intended to depend from claim

25. Claim 26 will be examined as depending from claim 25 to provide sufficient antecedent basis for “the solid portion”.

11. Regarding claim 27, there appears to be lacking a recitation for “directing a first laser beam into the channel” to precede “through a first opening of the optical conductor”. For purposes of examination, the claim will be examined with the inclusion of the above recitation.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

13. **Claims 1, 2, 4-10, 33, 34, 37 and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Lewandowski et al. (cited by the applicant).** Lewandowski et al. discloses non-atomic (micron sized > 10 nm) particles being guided through a hollow optical fiber by a laser, which confines the particles. A source of the particles is provided before confining the particles inside the beam (inherent). The particles, in air or in aqueous solutions, are guided down the hollow portion of the fiber. Lewandowski et al.

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disclose 7 μm glass and polystyrene particles. Applications include transfer of a particle (one material) or separation of particles (more than one material), and deposition onto a surface (substrate). It is noted that the laser beam would have inherently imparted a degree of thermal treatment to the particles. It is also noted that hollow optical fibers typically comprise a first opening, upon which an optical beam is incident, and a second opening, through which an optical beam exits, wherein the first and second openings are located at two opposite ends of the optical fiber. Furthermore, since Lewandowski et al. discloses the method of guiding particles through a hollow optical fiber by means of a laser beam, the apparatus inherently includes at least a hollow optical fiber (an optical conductor having a first and second opening, a through channel or a hollow portion), a particle source, and a laser beam since those three elements are necessitated in the method that is disclosed.

14. Claims 1-3, 5-10, and 30-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishimura et al. (U.S. Patent 5,495,105).

15. Nishimura discloses a method of guiding one or more non-atomic particles. The method comprises confining the particles inside the laser beam and directing the laser beam into a hollow portion of an optical conductor (the beam propagating along the longitudinal axis), wherein the particles confined inside the laser beam are guided by the laser beam propagating inside the hollow portion. See Figure 5, column 1, lines 19-21 and column 5, line 52 through column 6, line 56. Regarding claim 2, the reservoir 41 comprises the source of the particles before confining the particles inside the beam. Regarding claim 3, optical systems 46, 48 and 50 focus the laser beam. Regarding claims 6-8, in column 2, lines 36-38, a liquid dispersion medium, and solid particles made of one

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material are disclosed. Regarding claim 9, in column 7, lines 42-49, particles made of two or more materials (i.e. differing in refractive index) are disclosed. Regarding claim 10, Nishimura et al. discloses fine particles such as blood cells, viruses, and microorganisms, which have a linear size of larger than 10 nm. For example, red blood cells have a linear size on the order of several micrometers.

16. Regarding claims 30-32, Nishimura et al. also discloses a method of confining a particle inside a hollow portion of an optical conductor, the method comprising, confining the particle inside a laser beam; directing the laser beam with the confined particle into the hollow portion through a first opening of the optical conductor; and transporting the particle inside the hollow portion by causing the laser beam to propagate inside the hollow portion until a velocity (e.g. horizontal velocity) of the particle reduces to about zero. The optical conductor is substantially vertical. The laser beam exits the optical conductor through a second opening. See Figure 5, column 5, line 52 through column 6, line 56.

17. Regarding claims 33-38, Nishimura et al. discloses an apparatus comprising an optical conductor (having axes 43 and 44) having a first opening (defined by the narrowed outlet of reservoir 41); and a laser beam (45) capable of entering the hollow portion (through channel) of the optical conductor through the first opening and propagating inside the hollow portion while guiding one or more particles confined inside the laser beam. Regarding claim 34, the reservoir 41 is the source. Regarding claim 35, note optical system 46. Regarding claim 36, the laser beam exits the optical conductor through a second opening. As noted previously, the hollow portion is filled with a liquid (dispersion medium).

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18. **Claims 33-40 and 42 are rejected under 35 U.S.C. 102(e) as being anticipated by Kindler et al. (U.S. Patent 5,993,549).**

19. Kindler et al. discloses an apparatus for guiding one or more particles into a hollow portion of an optical conductor, and more specifically an apparatus for depositing one or more particles onto a substrate. The apparatus comprises an optical conductor (32) having a first opening and a through channel (hollow portion filled with a gaseous medium); a laser beam (28); and a substrate (22) disposed to allow the laser beam exiting the channel through a second opening to contact the substrate. Regarding claim 34, the apparatus further comprises a source (10) for providing one or more particles. Regarding claim 35, the apparatus further comprises an optical system (58) for focusing the laser beam. Regarding claim 26, it is noted that the laser beam exits the optical conductor (32) through a second opening (see column 7, lines 15-19). Regarding claim 40, it is noted that the first and the second openings are located at the two opposite ends of the optical conductor (see Figure 1). Regarding claim 42, the substrate inherently comprises a plurality of locations onto which the particles can be deposited. It has been held that the recitation that an element is "capable of" performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. *In re Hutchison*, 69 USPQ 138.

Claim Rejections - 35 USC § 103

20. **Claims 3, 11-20, 24-26, 35, 36 and 39-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lewandowski et al.**

21. Lewandowski et al., as discussed above, discloses guiding non-atomic particles (about 7 μm in size, which is larger than a wavelength of conventional laser beams)

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through a hollow optical fiber by means of a laser beam. Lewandowski et al. discloses particles in aqueous solutions (i.e. comprising a liquid portion and a solid portion). As previously noted, the laser beam would have inherently imparted a degree of thermal treatment to the particles.

22. Regarding claims 11-15, 20, 21, 24-26 and 39-42, Lewandowski et al. does not specifically disclose the method of material deposition, or an apparatus for material deposition. However, material deposition on a substrate is clearly suggested by Lewandowski et al. That is the step of depositing a material onto a substrate is suggested, and the apparatus comprising a substrate is also suggested. Any substrate inherently comprises a plurality of locations onto which the particles can be deposited. The step of moving the substrate is not specifically disclosed. However, the step of moving the substrate would have been obvious to deposit the particles at various locations on the substrate to form a pattern or to form a uniform coating across the substrate surface. The step would require the laser beam, and the confined particles, to exit the optical conductor through a second opening, optical fibers commonly comprising first and second openings. Therefore, claims 11-15, 20, 21, 24-26 and 39-42 are obvious over Lewandowski et al.

23. Regarding claims 3, 35 and 36, Lewandowski et al. does not specifically disclose a focusing system. Focusing arrangements are well known in the art of fiber optics. A focusing arrangement would have been obvious for the purpose of increasing the coupling efficiency of the laser beam in to the hollow optical fiber. Additionally, Lewandowski et al. does not specifically disclose the step wherein the laser beam exits the optical fiber through a second opening. As stated previously, optical fibers

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commonly comprise first and second openings for coupling in and coupling out optical beams. The method step would have been obvious to couple out the laser beam and the confined particle for particle transfer, separation, or deposition, as suggested by Lewandowski et al.

24. Claims 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ashkin (U.S. Patent 3,808,550) in view of Lewandowski et al.

25. Ashkin discloses a method of confining a particle, comprising directing a first laser beam in a first direction, directing a second laser beam in a second direction which is collinear with the first direction, and confining the particle (by causing the first and the second laser beams to propagate toward each other) (see column 5, lines 56-68). Ashkin further discloses that changing an intensity of one or both laser beams changes a position of the confined particle (see column 6, lines 1-12). Ashkin does not specifically disclose an optical conductor having first and second opening disposed opposite to each other and through which the laser beams are directed. Lewandowski et al. discloses a method of guiding a particle inside a through channel of an optical fiber. Optical fibers commonly comprise first and second openings for coupling in and coupling out optical beams. Both disclosures relate to particle guidance and manipulation using a gradient force from a laser beam. One of ordinary skill in the art would have found it obvious to perform the method of Ashkin using a hollow optical conductor as disclosed by Lewandowski et al. One of ordinary skill in the art would have been motivated to modify the disclosure of Ashkin to comprise an optical conductor of Lewandowski et al. for the purpose of guiding the laser beam and the confined particles with greater precision. Regarding claim

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28, Ashkin discloses that the laser beams are directed horizontally (see column 3, line 64).

26. **Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kindler et al. in view of Richart (U.S. Patent 5,854,311).**

27. Kindler et al., discussed above, does not disclose the size of the powder particles. Richart discloses that an ideal coating powder is comprised of particles having sizes ranging from 10 to 40 μm , resulting in a coating of improved smoothness (see column 3, lines 33-37). Both Kindler et al. and Richart relate to coating powders. One of ordinary skill in the art would have found it obvious to comprise the coating powder of Kindler et al. with particles that are larger than about 10 nm in size, as taught by Richart. One of ordinary skill in the art would have been motivated to provide the claimed particles to manufacture a coating with a high degree of smoothness, as taught by Richart.

Double Patenting

28. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

29. Claims 16-19 are rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-4 of prior U.S. Patent No. 6,823,124. This is a double patenting rejection.

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30. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

31. Claims 22 and 23 rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 5 of U.S. Patent No. 6,823,124.

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Although the conflicting claims are not identical, they are not patentably distinct from each other because the patent claims at least all of the features of claims 22 and 23.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sarah Hahm whose telephone number is (571)272-2359. The examiner can normally be reached on T-F 7:30am -6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Uyen-Chau Le can be reached on 571-272-2397. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sarah Hahm/
Primary Examiner, Art Unit 2874